

sec-BUTYL ALCOHOL

CAS Registry Number: 78-92-2



Molecular Formula: $\text{C}_4\text{H}_{10}\text{O}$

sec-Butyl alcohol is a colorless, flammable liquid with a wine-like odor. It is soluble in water, alcohol, benzene, ether, and acetone (HSDB, 1991). It auto-oxidizes to an explosive peroxide (Sax, 1989).

Physical Properties of sec-Butyl Alcohol

Synonyms: 2-butanol; butylene hydrate; 2-hydroxybutane; methyl ethyl carbinol;
1-methyl-1-propanol

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| Molecular Weight: | 74.12 |
| Boiling Point: | 99.5 °C |
| Melting Point: | -115 °C |
| Flash point: | 31 °C (88 °F) (open cup) |
| Vapor Density: | 2.6 (air = 1) |
| Vapor Pressure: | 18.3 mm Hg at 25 °C |
| Density/Specific Gravity: | 0.8063 at 20/4 °C |
| Log/Octanol Water Partition Coefficient: | 0.81 |
| Water solubility: | 181 g/l at 25 °C |
| Henry's Law Constant: | 9.1×10^{-6} atm-m ³ /mole at 25 °C |
| Conversion Factor: | 1 ppm = 3.03 mg/m ³ |

(Howard, 1990; HSDB, 1991; Merck, 1989)

SOURCES AND EMISSIONS

A. Sources

sec-Butyl alcohol is primarily used in the manufacture of methyl ethyl ketone and other organic compounds. It is used as a solvent, cleaning agent, paint remover, and is found in perfumes, flavors, dyestuffs, and wetting agents (Merck, 1989). Gasoline exhaust may also contain sec-butyl alcohol (Howard, 1990).

The primary stationary sources that have reported emissions of sec-butyl alcohol in California

are partitions and fixtures manufacturing, fabricated metal products, and transportation equipment (ARB, 1997b).

B. Emissions

The total emissions of sec-butyl alcohol from stationary sources are estimated to be at least 15,000 pounds per year, based on data reported under the Air Toxics “Hot Spots” program (AB 2588) (ARB, 1997b).

C. Natural Occurrence

sec-Butyl alcohol has been identified in such diverse foodstuffs as baked potatoes, apples, pears, a gruyere-type cheese, fried bacon, roasted filberts, and dry legumes. It is also found in poultry manure and mussels (Howard, 1990).

AMBIENT CONCENTRATIONS

No Air Resources Board data exist for ambient measurements of sec-butyl alcohol.

INDOOR SOURCES AND CONCENTRATIONS

No information about the indoor sources and concentrations of sec-butyl alcohol was found in the readily-available literature.

ATMOSPHERIC PERSISTENCE

The only important chemical loss process for sec-butyl alcohol in the troposphere is expected to be by reaction with the hydroxyl (OH) radical. Based on the estimated rate constant for the OH radical reaction (Kwok and Atkinson, 1995), the calculated half-life and lifetime of sec-butyl alcohol due to reaction with the OH radical is estimated to be about 1.0 days and 1.5 days, respectively (Atkinson, 1995). The major product of the OH radical reaction is expected to be 2-butanone (methyl ethyl ketone) (Atkinson, 1994). Since sec-butyl alcohol is very soluble in water, it may also be removed by wet deposition (Howard, 1990).

AB 2588 RISK ASSESSMENT INFORMATION

Although sec-butyl alcohol is reported as being emitted in California from stationary sources, no health values (cancer or non-cancer) are listed in the California Air Pollution Control Officers Association Air Toxics “Hot Spots” Program Revised 1992 Risk Assessment Guidelines for use in risk assessments (CAPCOA, 1993).

HEALTH EFFECTS

Probable routes of human exposure to sec-butyl alcohol are inhalation, ingestion, or dermal contact.

Non-Cancer: sec-Butyl alcohol is the least toxic of the butyl alcohols (Sittig, 1991). Depression of the central nervous system from short-term exposure produces symptoms of headache, dizziness, and drowsiness. Effects from inhalation exposure include irritation of the eyes, throat, and skin. Long-term exposure of the skin may result in drying and cracking. Pulmonary edema, irregular heartbeat, and liver and kidney damage have been reported from high levels of exposure (HSDB, 1995). The United States Environmental Protection Agency (U.S. EPA) has not established a Reference Concentration (RfC) or oral Reference Dose (RfD) for sec-butyl alcohol (U.S. EPA, 1995a).

Cancer: The U.S. EPA and the International Agency for Research on Cancer have not classified sec-butyl alcohol as to its carcinogenic potential (U.S. EPA, 1995a).

